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V. V. Parin

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Drawing: If it goes on continuously that way I will play the entire solar system.

In the joyous days of April, when the soviet nation has made an unprecedented step forward - dispatching of cosmic ship-satellite VOSTOK into interastral spaces, on the pages of the periodocal "SMENA" (Change) was printed a report by a member of the presidium of the Academy of Medical Sciences Vasil Vasilyevich Parin. In this report the known soviet scientist tells about how the attack against the cosmos was being readied.

Today we are publishing a new report by prof.V.V.Parin devoted to important problems of man's cosmic flights.

Weight of Man Three Tons....

Let us forget for a minute about the cosmos. Let us imagine an ordinary street and an ordinary bus station. We board the bus. It vibrates and begins rapidly gaining speed. If you succeeded in holding on to something you will not fall. If for some reason or other you failed to hold on to something...and invisible force will grab you and pull you through the entire bus. Finally you will fall. Exatly the very same picture is observed during sudden deceleration of the bus. And will happen when you are on board a cosmic ship and its begins gaining speed, let us say, to 8 km/sec or that it needs to dampen such a collossal speed ? you will feel a horrible weight. You will find yourself in a state called overload.

Overlaod is known immediately after the cosmic ship breaks away from the Earth

and began picking up speed for orbiting. It becomes evident also during entry into dense layers of the atmosphere ,when the ship begins decelerating in preparation for executing the landing.

It was figured out that at the time of cosmic flight overload may increase by eight and sometimes even ten times in comparison with ordinary terrestrial gravitation. If under ordinary conditions a persons hand weighs 3 kg,then during an overload its weight will go up to 30 kg. Try lifting such a weight ! it is figured that even at a fourfold increase inweight a person will generally not be able to move arcund. And what can be done by a cosmonaut weighing 700 kg! his heart cannot carry on its functions. It is heavy not only by itself. It becomes heavy, literally the mercury, and the blood, which it distills. At considerable overloads affecting in direction from head to legs, the heavy blood remains in the lower parts of the body, the heart begins idling, the brains receive no blood, the person looses conscience. Respiration is disrupted. The lungs become quite heavy.

Sofar no methods have been found which would allow to do away with such a state. But it can be made easier. To make it easier the overload should affect the person not in direction of head-legs or from legs to head, but in direction of the spine and chest or from chest to spine, or from any one side to the other. That is why when orbiting a cosmic ship and during its entry into the dense layers of the atmosphere the cosmonaut should be in half-lying position.

Thanks to thorough development of a system of training our first discoverer of the universe Yu.Gagarin the flight conditions were for him much easier than the training conditions.

Right now science is faced with a problem - to make easy for cosmonauts journeys along much farther interastral routes.

We must keep in mind, that the magnitude of overload is the lower when the cosmic ship is gradually gaining the necessary velocity. But here there can be conflicts between the requirements of physiology and the technique of aero-navigation. At one

time these conflicts appeared to unsolvable. And as unual to the aid came an entirely unexpected factor.

The great russian scientist K. E. Tsiolkovskiy has made a curious experiment, which is based on the use of the Archimedes law concerning a body, submerged in a liquid. In a metallic jar with water Konstantin Edvardovich placed a chicken egg. The egg drowned. Having covered the jar with his palm, he struck same against the table. The egg broke. The scientist then dropped table salt into the water, the egg remained suspended in the water above the bottom, it did not lower nor rise. The specific weight of the liquid became equalized with the specific weight of the egg. Another knock against the table and the egg remained unharmed. Other researchers sealed the tin jar with the egg and salt solution and dropped it from a height of several meters. And again the egg remained unbroken and undamaged. The forces of hydrostatic pressure of the water have balanced the inertia forces and the egg experienced almost no overloads.

From these experiments scientists went over to experiments with low organized, single cell organisms. It was explained, that these organisms, when submerged in a liquid, safely endure accelerations 200 thousand times greater than terrestrial! After this scientists have been aided by the age-old satellite of researchers - the frog. The weight of the amphibious situated in water was increased by 2800 times! It is believed that something happened to the experimental object? Not in the least. All frogs appear to be untouched.

At present time science is occupied with the task of solving the most complex problem. Is it possible to place in a liquid, close by its specific weight to the weight of a person, the cosmonaut? It is assumed, that the cosmonaut in an airtight suit should be placed in a special chamber filled with liquid. In it he will be situated in suspended state, as the egg in the famous experiment by E. K. Tsiolkovskiy. It is hoped, that in this case it is fully possible to endure thirty-forty-fold increase in weight.

At such a time the cosmonaut will weight almost three tons.

"The Devil is not so dreadful.."

It was thought at first that weightlessness has a destructive effect on the human organism, on the function of all his organs and systems. The alimentary tract will function poorly, and so will the cardio-vascular system. It was assumed that under weightlessness the air will stop around the mouth and the person will suffocate by the air naturally exhaled from the lungs. Gloomy assumptions were made with respect to reception of food and water.

But observations of animals on board cosmic ships explained that the vital activity of the organism under conditions of weightlessness is normal. The only deviation from the norm was a moderate (by 10-15%) drop in arterial blood pressure on account of disappearance of its weight. But this is no worry for the healthy organism. It is known that here on Earth within the course of a working day we experience exactly the same deviations in arterial pressure and don't even notice it.

This is how the first cosmonaut Yu. Gagarin described the sensations under the state of weightlessness during his unprecedented flight around the Earth.

First of all he did not feel the back of the chair, to which he was strapped at blast off. But he felt the straps. Everything around him became lighter, he felt a sensation of unusual lightness. And this is a very unusual feeling. The arms and legs and the entire body became as if foreign. They weighed nothing. You gained the impression that of/[not]sitting, but lying down, and are as if suspended in the cabin. All unsecured objects hovered around in the air. Coordination of movements was in no way impeded. Rather in reverse. At this time the cosmonaut recorded, and all he had to do is to hold on the notebook, which tried to sneak out from under his hands. The handwriting remained the same as on Earth, under ordinary conditions. Yu. Gagarin at this time manipulated instruments and devices, carried on radio transmission to Earth using a telegraph key. Reception, in his own words, was not bad.

In the state of weightlessness he ate and drank. The unusual state was in no way a

hindrance to him in polishing off the cosmic breakfast. He ate with same appetite as on Earth.

In this way weightlessness is not such a horrible problem, as it has been described before. In any event, weightlessness does not represent a danger to life. However long stay in the state of weightlessness may be destructive. And that is why. A human being like any other living things, rapidly adapts itself to changed conditions. He will consider weightlessness as a natural condition, exactly as we consider as natural the terrestrial gravitation. And when the cosmonaut will begin returning to his home planet, this adaptation will immediately let know about its existence. The overloads during deceleration of the cosmic ship will become for him more perceptible, and possible, even dangerous. That is why during long lasting - many months and many years - trips to eliminate the effect of loss in weight on the ship it is suggested to create artificial gravitation by rotating the cabin or the entire ship around any one of its axis. It is therefore concluded: weightlessness is no obstacle on man's way to far off cosmic spaces.

The doors to the universe are open

Yet beyond the limits of the terrestrial atmosphere man is met by danger. One of it - cosmic rays. This invisible and cunning enemy comes to our planet from the inconceived cosmic spaces. cosmic rays travel at near light speeds. They possess enormous energy. And here is an example.

If a steel pellet weighing one gram is accelerated to the speed of light, and if this pellet would fall into the Black Sea, it will make it boil. True, particles of cosmic rays are much smaller than a steel pellet. To compare same is like to compare a dust particle with the structure of the Bolshoy Theatre in Moscow. Yet such cosmic rays are dangerous for the organism. To protect against them is possible only with the aid of a thick steel shell.

The origin and sources of cosmic rays have so far not been explained. That is why further investigation of same would give science many new data.

The first Soviet cosmic rockets and satellites sent to Earth an alarming news: our planet in addition to cosmic rays, is surrounded by a double radiation band. It produced very strong radiation, which is intensified at times. Man's flight through this band is very dangerous. What can be done to bypass this danger? A way out has been found.

It was found that the radiation belt (ring) is quite far from the Earth. Its upper boundary is situated at an altitude of 20-30 thousand km. ——————— the lower boundaries at an altitude of 600 km. These boundaries are unstable ,they vary one way or another . Nonetheless a flight to an altitude of 500 km from the Earth, and Gagarin's flight was at a much lower altitude - bears no danger for the cosmonaut.

And how will it be during the trip to the Moon , and other planets and other starry worlds ? It appears that near the northern and southern poles of the Earth are situated radiation free zones. These are some kind of doors,through which man can move into the imperceived distances of the universe.

Worse will be the job of the cosmonaut's return home. To decelerate the cosmic ship it will be necessary to fly around the Earth for several times at high altitude. Here the threatening belts can no longer be by-passed. Consequently the task of scientists is to create a light an reliable biological protection of the crew against penetrating radiation, as it is done, for example, at modern atomic electric power stations.

The problem of protecting man againstany kind of radiation will be possibly solved also by another method. It appears,that there are chemical and pharmacalogical substances, which make the organism more ——— resistant to radiation. Today scientists are working on the derivation of these safety media, which will give man the possibility of realizing a more distant walk into the cosmos.

But this is still not all. To increase the stability of the organism to radiation is also possible by artificially slowing down the vital processes in theorganism, i.e.

delaying for a certain time its demands for food, water and oxygen.

Imagine that you are the cosmonaut. Your cosmic ship is being dispatched toward Mars. Before the blast off you were put to sleep, and you felt no monstrous effects of acceleration at take off, no weightlessness, no other bad changes of the far off journey. You needed no food, no water. You did well without larger oxygen supplies. And when your ship began approaching the object of the journey, an electronic machine connected the cabin heating, and you awakened. You yourself have already executed the landing of the ship.

" Such a sleep,yes and without oxygen, is not in existence "- is rightfully surmised by the reader. That is true. But in this case it was not at all an ordinary sleep, a hypothermal sleep, that is a sleep, produced by cooling the body to a maximum possible temperature.

Experiments on the cooling of living organisms were carried out on rats, white mice and dogs. During the entire time their body temperature indicated zero on the thermometer. It appeared that the animals will not withstand such a cold. And when they were placed in warm, their hearts began beating, respiration and even memory were restored.

To five degrees below zero was dropped the temperature in a hamster. Half of the water contained in its body froze and even the blood converted into ice. But the animal was warmed up. It began kicking, it opened its eyes and began running around, as if nothing happened.

In surgery, during cardiac operations the temperature of the human body was reduced to plus 28 degrees.Respiration and heart beat were reduced sharply. For several minutes it was even possible to stop blood circulation. The person was as if under narcosis.

It is considered abroad, that a persons condition of "cold sleep" at the time of his distant journeys (journeys into cosmic space) will enable him to endure considerable overloads, the ship will require lesser food supplies,less water and oxygen. And

this will considerably reduce the weight of the ship.

It is difficult to say, how real the given project is. But there is no question that the best way of all is that the cosmonaut should carry out his far off journeys in his ordinary, natural habitat (condition).

The strongest fusion in the world. (Combination of Thought and Labor )

The first cosmic flight in history gave highly valuable data on the condition of the human being in flight. It confirmed the assumptions of Soviet scientists not only about the possibility of man's flight into the cosmos, but also the possibility of man's capability of preserving his creative forces and workability.

Preliminary data, obtained as result of the first cosmic journey, show, that Yu. Gagarin's flight was realized extremely well. When the ship-satellite was being brought into orbit and during its return to Earth the pulse and respiration of the cosmonaut were approximately the same, as at the time of preliminary training, carried out prior to the flight. Under conditions of weightlessness pulse and respiration remained almost perfectly normal.

Soviet science and technology developed sufficiently reliable means, assuring the maintenance of the necessary vital conditions of the organism during long lasting flight. Particularly important is the fact that the developed system of ships return from the flight guarantees safety of man's cosmic journey.

Right now it is difficult to evaluate the entire value of cosmic flights for humanity. It is impossible to the fullest extent to discuss the perspectives opening thereat. One thing is clear: man's penetration into the cosmos flings wide open the boundaries of our learning (perception), it enriches science and culture.

Already in the very near future it is possible to expect the utilization of cosmic devices for the solving of important practical problems. Weather and ice exploration services, relay of TV and radio transmissions, the carrying out of the broadest scientific investigations beyond the terrestrial atmosphere- are only the first steps in that direction. Then comeman's flights to the Moon and other planets of the solar

system, creation of inhabited interplanetary stations, gradual adaptation of man's life in space. And then the presently appearing fantastic possibility of establish ing communication with other worlds.

What has been only yesterday a myth, has become a reality of our day. The strongest fusion (combination) in the world-combination of intelligence and labor of soviet people opened for man a way to the stars.

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